High Field MR Research in Drug Abuse: A Bioengineering Research Partnership

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I) Basic Engineering Projects

1. Objective motion detection and correction in time series fMRI experiments.
2. Optimized phased array coil design.
3. FMRI image registration and signal dropout reduction in brain regions with high susceptibility effects.

II) Applied Engineering Projects

4. Functional T2 relaxometry of brainstem and midbrain monoaminergic nuclei.
5. Estimation of cerebral blood flow and volume using dynamic susceptibility contrast MRI.
6. Proton echo-planar spectroscopic imaging at 4 T.
7. Two-dimensional, proton magnetic resonance spectroscopy of amino acid neurotransmitters.
8. Concurrent, high resolution near infrared spectroscopy (NIRS) imaging and fMRI.

III) Technology Extension Projects

9. Low field magnetic stimulator prototype.
10. 1H decoupled - 13C magnetic resonance spectroscopy *.
11. Visual psychophysics studies using fMRI at 4T *.
12. Sodium imaging at 4T *.
13. FMRI studies in neuropathic pain *.
14. Non-Human primate studies *.
15. PET imaging studies.

* (recently initiated projects)